

Y. Isozaki, M. Shimada, A. Kikuchi, N. Nakagoshi, T. Nagata, A. Sakamura & W. Yamazaki (2004) Application of Drainage Direction Matrix (DDM) to landscape analysis in a dam watershed, southwestern Japan. Proceedings of the First EAFS International Congress, p87. Mokpo, Korea.

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A watershed is a fundamental spatial unit about water circulation, substance circulation and dynamics of ecosystem. A watershed has the hierarchical structure in alignment with channels of a river, and the spatial slope through the water dynamics. In order to grasp the landscape structure of a watershed effectively, it is indispensable to take into consideration these hierarchical structures and drainage patterns. In this paper, we apply a technique of DDM in order to analyze the hierarchical structure and drainage pattern of a watershed. DDM is a technique which extracts drainage pattern of a specific area, and it is possible to calculate automatically from Digital Elevation Model (DEM) by a computer program. Using such a digital method, wide spread of drainage pattern can be extracted in a short time. Moreover, by using DDM, upstream area can be searched from optional points on the DEM, and drainage courses of water or substance could be predicted, respectively. The study site was in Haji dam watershed (307.5 square kilometers), southwestern Japan. DDM was extracted from 10mDEM which covered the study site. Land use map was digitized by classifying the orthorectified aerial photos. The landscape structure of the region was analyzed on the basis of these data. Based on these data, the relationship between drainage pattern and land use will be discussed. Landscape composition will be illustrated in the watershed as a functional property.